

Wisconsin's 1996 Lake Michigan Charter Report

INTRODUCTION

The charter boat industry in Wisconsin grew steadily from 188 licenses in 1976 to 524 licenses in 1985 and 1988. More recently the industry has declined to 257 licenses in 1996 but the number of trips and anglers has remained stable the past 5 years. Therefore, the charter industry still contributes significantly to the sport fishing on Lake Michigan.

The Wisconsin charter harvest has been fairly stable the last **seven** years at about 80,000 fish per year. However, Lake Michigan has changed dramatically over the last several years with the change in forage composition, introduction of exotics (*Bythotrephes cederstroemi* - spiny water flea, *Gymnocephalus cernuus* - ruffe, *Dreissena polymorpha* - zebra mussel and *Morone americana* - white perch) and continued stocking of salmonine species. Charter reports are used by the Department to evaluate the fishery on Lake Michigan so that we can respond to the ongoing changes.

Data from the Charter Fishing industry have been instrumental in several **key** management decisions the Wisconsin Department of Natural Resources has implemented in the last 10 years in Lake Michigan: 1) salmonid stocking was reduced by 10% in 1986 to reduce predation mortality on alewives; 2) chinook salmon stocking was reduced by 25% in 1991 to reduce predation mortality on alewives and 3) coho salmon daily bag limit was reduced from 5 to 3 in 1995 to increase the number of adult fish returning to brood stock collection facilities in fall. These actions have led to an increase in the number of chinooks

harvested as well as an increase in the number of coho salmon returning to collection facilities.

The objective of the charter boat reporting forms is to obtain information on not only the number, type and location of salmonines caught on Lake Michigan and Green Bay but also demographics on the people who fish on those charters. The information collected will 1) help Wisconsin Department of Natural Resources Fish Management determine stocking levels; 2) provide fish managers with important trend information concerning the status of stocked salmonines in Lake Michigan; and 3) provide important data on the type of people fishing and location of the fishing trips.

METHODS

At the beginning of each fishing season, a packet of information was sent to each licensee. This packet included notes on important fishing items, a sample of a completed monthly report, grid map of Lake Michigan, list of wardens, coded-wire tag collection stations, finclip list, sea lamprey information, a supply of monthly report forms and a supply of steelhead log forms to record tagged fish.

Each license holder was required by law to report all paid charters. The report was to be mailed by the 10th of each month on the records for the preceding calendar month to the Plymouth Field Station of the WDNR. If a report was late or incorrectly filled out a warning letter was sent. Only one letter was sent per license holder and any subsequent violations were referred directly to a Wisconsin Conservation Warden.

The information obtained from each form included: license number, fishing port, date of fishing trip, grid fished, number of resident and nonresident anglers, number of fished harvested, time each trip started (am, pm, evening), number of lines fished and number of hours fished. This information had to be recorded within half an hour after completing each trip after returning to the dock or shore. The number of lake trout, coho salmon, brown trout, steelhead, chinook salmon and other species caught, tag numbers present and the number of lampreys attached to chinook salmon and lake trout had to be recorded prior to midnight of the day of each trip. The data were received at the Plymouth Field Station, entered and checked for errors.

During the 1996 season, detailed maps of marinas in Kenosha, Racine, Milwaukee, Port Washington and Sheboygan were created that showed the mooring locations of all charter boats. Creel clerks or field personnel would record whether a charter boat was out of port. This project was undertaken based on the concerns of many charter captains that claimed some trips went unreported. This project could help Fish Management determine the percentage of unreported charter trips and thus unreported harvest of salmonines.

RESULTS

Survey results

During the 1996 season, 72 charter boats were recorded by field personnel to be out of their mooring slips. The data were loaded into a file and cross checked with reported trips from charter captains. A total of 53 trips or 74% were reported by captains, with 19 or 26% unaccounted trips. Since all of the unaccounted trips

occurred after July 1st, a possible problem may exist and extra enforcement and monitoring may be warranted for the 97 season.

Compliance

During 1996, 84 or 33% of all charter captains did not send their reports in on time. In addition, an average of 23 or 9% of all monthly charter reports were not sent in on time. The average compliance time for the monthly reports was about one month with the final compliance rate for 1996 of 98%.

Effort

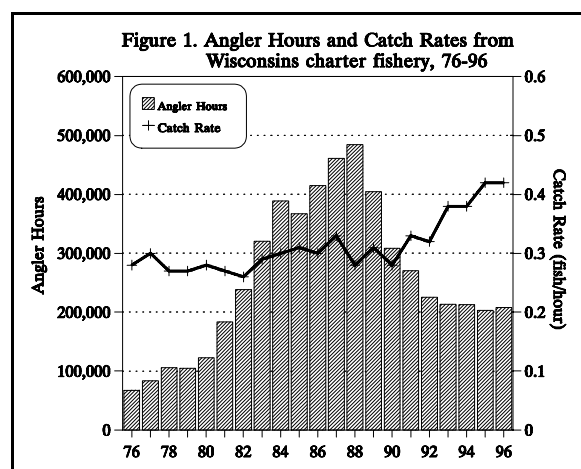
The number of charter licenses for the 1996 charter season was 257, which was the lowest since 1982 (Table 1), but the decline from the previous year was only 7 licenses, the lowest decline in 7 years. The number of angler hours increased by 2% from 1995, the first increase in 8 years (Figure 1). In addition, boat hours increased by about 2% and line hours increased by 4% (Table 1). The number of total anglers increased slightly from 42,462 in 1995 to 42,967 in 1996 with the increase present in the nonresident angler category.

Change in angler effort, unlike previous years in which it was most noticeable at northern or southern ports, varied from port to port. Washington Island-Sturgeon Bay angler hours declined by 6% from 1995 the ninth straight year of declining effort (Table 4). Algoma-Kewaunee angler hours increased by 8% from 1995 (Table 5). Both Two Rivers-Manitowoc and Sheboygan angler hours increased by 8% and 1%, respectively from 1995, reversing a trend of 7 straight years of declining effort (Table 6 & 7). Port Washington-Milwaukee angler hours

decreased in 1996 by 8% while Racine-Kenosha hours increased by 13% (Table 8 & 9). The Port Washington-Milwaukee area had the largest decrease over the last year declining by 8% (Table 8).

Catch rate

The catch rate (number of fish caught per hour) was 0.42 in 1996 (Table 2 & Figure 1). Despite a decrease in the number of captains the catch rate over the years has remained fairly constant and even increased. The catch rate for 1996 was tied for the highest ever recorded. This can be attributed to the strong coho and chinook salmon harvest in the south plus an increase in chinook salmon harvest in the Algoma-Kewaunee, Two Rivers-Manitowoc and Sheboygan areas. This parameter provides one of the best measures to evaluate the charter industry.



Harvest

Chinook salmon, for the first time in 9 years, dominated the catch at 39% (34,173 fish) with coho salmon second at 31% (27,025) (Table 3). A big decrease in lake trout harvest from 1995 (-8,360 fish) was present. The brown trout

harvest decreased from 2,730 fish in 1995 to 2,204 fish in 1996, representing 3% of the harvest. Steelhead harvest declined by 10,148 fish from 1995 to 12,917 fish comprising 15% of the catch.

Chinook salmon catch rates (fish per angler hour) remained fairly constant compared to previous years. The Washington Island-Sturgeon Bay area had the best catch rate (0.31 chinook/hour). Algoma-Kewaunee area catch rate was also quite high (0.24 chinook/hour). The other ports had higher catch rates for chinook salmon than in previous years (0.09-0.15 chinook/hour).

Coho salmon catch rates were highest in the Racine-Kenosha area at 0.32 coho/hour with Port Washington-Milwaukee substantially behind at 0.15 coho/hour. Due to coho migration patterns, the other ports had very low coho catch rates (i.e. below 0.06 coho/hour).

Steelhead catch rates were intermediate to low in all areas in 1996. The Algoma-Kewaunee area had the highest catch rate at 0.09 steelhead/hour while the Two Rivers-Manitowoc area was close behind at 0.08 steelhead/hour. All other ports had similar catch rates (0.05-0.07 steelhead/hour).

Kenosha-Racine area had the highest catch rates for lake trout at 0.08 lakers/hour followed closely by the Algoma-Kewaunee area at 0.07 lakers/hour. The Two Rivers-Manitowoc area also had higher lake trout catch rates at 0.06 lakers/hour. The other ports had low catch rates (0.02-0.04 lakers/hour).

Brown trout catch rates were 0.01 or 0.02

in every port. The catch rates for brown trout are the lowest among the species and is reflected in their low harvest numbers in almost every year.

The monthly breakdown shown in Table 10 illustrates the monthly totals for angler hours, harvest and catch rates. In May, the catch rate was high at 0.59 fish/hour but lower than previous years due to the low numbers of steelhead caught. The catch rate declined but was still high at 0.31 in June based on the strong coho salmon catch. The July catch rate increased to 0.39 fish/hour with a strong coho salmon harvest of 9,868 fish. The August catch rate of 0.45 fish/hour was the highest its been in 11 years due to the 18,483 chinook salmon and 3,538 coho salmon caught. The September and October catch rates of 0.46 and 0.47 fish/hour were also the highest its been in the last 11 years with large amounts of chinook salmon taken in these months.

The homeport analysis (Tables 11-30) shows the breakdown of angler hours, catch rate and catch for the majority of ports captains listed on the Sport Trolling Guide Renewal License Application Form 9400-245R rev. 8-86. Five ports, including Algoma, Kenosha, Port Washington, Sheboygan and Winthrop Harbor harvested 55,834 fish or 65% of all salmonines (Figure 3). Six other ports, Gills Rock, Milwaukee, Racine, Sturgeon Bay, Kewaunee and Manitowoc harvested 24,561 fish or 28% of all salmonines. These ports comprised 93% of the harvested salmonids. Several ports had extremely high catch rates. Kenosha catch rates were 0.62 fish/hour followed by Sturgeon Bay at 0.56 fish/hour, Winthrop Harbor at 0.55 fish/hour, Racine at 0.48 fish/hour and Rowley's Bay at 0.46 fish/hour. Both the harvest and higher catch rates were

concentrated in the southern and northern ends of Lake Michigan due to the excellent chinook salmon and coho salmon harvest exhibited in 1996.

Sea lamprey incidence rates (lamprey per 100 fish) for Wisconsin water's of Lake Michigan (Table 31) for chinook salmon and lake trout were 0.04 and 0.17, respectively. These rates were much lower than reported by Michigan for their 1989 charter season.

SUMMARY

The 1996 charter fishing season was very successful especially for catches of coho and chinook salmon. Inclement weather caused poor catches in May, June and part of July. By mid-July through the end of the season, the catches of chinook and coho salmon were tremendous. It seems that the huge success of captains catching these two species attributed to the lower catches of both steelhead and lake trout. This may signal the fishermen and captains return to the king of all fish, the chinook salmon.

TABLE 1
Wisconsin's Lake Michigan
Charter Fishery Effort: 1976-1996

Year	Number of charter licenses	NUMBER OF ANGLERS			EFFORT HOURS		
		Resident	Nonresident	Total	Angler hours	Line hours	Boat hours
1976	188	9,801	3,354	13,155	67,578	88,036	16,406
1977	200	11,478	4,910	16,388	83,820	113,510	19,403
1978	159	13,300	6,203	19,503	105,667	136,861	21,869
1979	144	13,483	7,099	20,582	104,649	144,866	22,528
1980	154	13,821	9,260	23,081	122,463	169,908	24,827
1981	172	16,731	15,421	32,152	183,525	249,821	34,822
1982	264	18,966	25,548	44,514	238,639	338,812	48,921
1983	364	21,770	38,577	60,347	320,724	472,184	67,407
1984	477	21,936	47,683	69,619	389,252	630,899	83,433
1985	524	21,536	46,764	68,300	367,182	620,720	80,063
1986	510	23,250	53,921	77,171	414,820	784,931	90,153
1987	497	24,776	61,613	86,389	461,351	889,752	99,608
1988	524	28,273	64,484	92,757	484,685	1,013,855	105,860
1989	501	24,648	53,772	78,420	404,432	883,946	89,381
1990	437	22,467	33,144	59,611	308,755	685,462	68,102
1991	388	20,867	32,789	53,656	270,414	602,725	60,014
1992	340	19,425	27,704	47,129	225,254	544,689	50,619
1993	295	19,797	24,356	44,153	213,198	539,429	47,930
1994	284	19,732	24,356	44,088	213,113	552,428	47,425
1995	264	20,019	22,443	42,462	203,019	505,786	44,449
1996	257	20,180	22,787	42,967	207,895	525,388	45,260

TABLE 2
Wisconsin's Lake Michigan
Charter Fishery Catch Rate: 1976-1996

Year	Fish/Angler Hour	Angler Hours/Fish
1976	0.28	3.52
1977	0.30	3.34
1978	0.27	3.63
1979	0.27	3.68
1980	0.28	3.55
1981	0.27	3.71
1982	0.26	3.78
1983	0.29	3.44
1984	0.30	3.31
1985	0.31	3.24
1986	0.30	3.34
1987	0.33	3.07
1988	0.28	3.62
1989	0.31	3.21
1990	0.28	3.60
1991	0.33	3.06
1992	0.32	3.17
1993	0.38	2.62
1994	0.38	2.60
1995	0.42	2.39
1996	0.42	2.41

TABLE 3
Wisconsin's Lake Michigan Charter Fishery Catch: 1976-1996
(Percent of Total Catch in Parentheses)

Year	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total Catch
1976	418 (2%)	1,261 (7%)	2,982 (15%)	11,449 (60%)	3,066 (16%)	19,223
1977	399 (2%)	1,986 (8%)	7,564 (30%)	9,660 (38%)	5,456 (22%)	25,117
1978	791 (3%)	2,508 (9%)	4,921 (16%)	11,873 (41%)	8,998 (31%)	29,136
1979	987 (3%)	1,460 (5%)	3,171 (12%)	13,978 (49%)	8,810 (31%)	28,420
1980	1,559 (5%)	1,149 (3%)	9,251 (26%)	9,900 (29%)	12,631 (37%)	34,526
1981	1,872 (4%)	1,525 (3%)	7,695 (16%)	17,464 (35%)	20,752 (42%)	49,455
1982	1,748 (3%)	873 (1%)	13,263 (21%)	20,997 (33%)	26,193 (41%)	63,150
1983	3,111 (3%)	1,967 (2%)	5,135 (6%)	46,730 (50%)	36,147 (39%)	93,129
1984	4,822 (4%)	3,247 (3%)	25,217 (22%)	34,503 (30%)	49,612 (42%)	117,709
1985	5,801 (5%)	2,790 (2%)	21,058 (19%)	26,475 (23%)	56,919 (50%)	113,293
1986	4,302 (3%)	4,003 (3%)	20,435 (16%)	27,857 (22%)	67,437 (54%)	124,034
1987	5,705 (4%)	15,635 (10%)	19,078 (13%)	32,696 (22%)	76,522 (51%)	149,636
1988	5,823 (4%)	20,491 (15%)	28,936 (22%)	37,463 (28%)	40,805 (31%)	133,518
1989	5,750 (5%)	21,300 (17%)	27,949 (22%)	34,016 (27%)	35,861 (29%)	124,876
1990	4,423 (5%)	12,937 (15%)	18,185 (21%)	26,829 (31%)	23,322 (27%)	85,696
1991	4,759 (5%)	15,378 (17%)	11,686 (13%)	25,893 (29%)	30,750 (35%)	88,466
1992	4,733 (7%)	13,961 (20%)	19,191 (27%)	16,718 (24%)	16,456 (23%)	71,059
1993	5,035 (6%)	24,891 (31%)	17,676 (22%)	17,249 (21%)	16,618 (20%)	81,469
1994	3,378 (4%)	24,641 (30%)	21,268 (26%)	14,212 (17%)	18,392 (23%)	81,891
1995	2,730 (3%)	23,065 (27%)	12,492 (15%)	18,332 (22%)	28,273 (33%)	84,892
1996	2,204 (3%)	12,917 (15%)	27,025 (31%)	9,972 (12%)	34,173 (39%)	86,291

TABLE 4
Washington Island-Sturgeon Bay Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	17,008	.46	214	128	173	6,211	1,036	7,762
1977	12,367	.44	124	93	123	4,035	1,104	5,479
1978	27,541	.30	384	314	232	4,622	2,631	8,183
1979	21,110	.25	376	79	122	2,520	2,134	5,231
1980	36,801	.20	866	162	380	2,320	3,651	7,379
1981	50,039	.19	1,080	190	123	2,820	5,380	9,593
1982	50,447	.20	796	62	328	3,124	5,706	10,059
1983	60,919	.21	1,466	79	113	3,269	8,083	13,026
1984	66,086	.24	2,479	180	489	2,287	10,632	16,112
1985	75,126	.27	2,174	264	508	3,490	13,780	20,295
1986	83,667	.25	1,331	256	564	2,225	16,514	20,890
1987	93,025	.24	1,529	388	254	1,361	19,236	22,768
1988	91,762	.19	1,195	1,115	169	2,802	12,443	17,724
1989	84,449	.25	2,170	2,765	969	1,996	13,025	20,925
1990	65,502	.22	2,260	1,826	66	1,866	8,204	14,222
1991	57,774	.27	1,447	1,730	66	636	11,774	15,653
1992	36,360	.22	881	1,547	27	677	4,951	8,083
1993	36,181	.27	1,086	2,883	58	541	5,160	9,728
1994	30,919	.34	668	3,085	19	643	6,227	10,642
1995	29,109	.47	519	1,798	48	1,059	10,234	13,658
1996	27,439	.39	246	711	54	1,106	8,493	10,610

TABLE 5
Algoma-Kewaunee Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	15,216	.28	56	358	185	3,202	491	4,292
1977	9,219	.35	41	533	505	1,721	398	3,198
1978	16,959	.29	37	738	200	3,029	929	4,933
1979	15,561	.33	50	301	146	3,923	737	5,157
1980	18,748	.33	162	378	984	2,950	1,741	6,215
1981	26,163	.29	153	302	283	3,610	3,190	7,538
1982	40,817	.22	206	211	726	2,962	4,971	9,080
1983	53,248	.25	394	839	403	4,219	7,570	13,427
1984	52,881	.29	419	928	1,051	3,246	9,468	15,174
1985	49,767	.32	526	729	482	3,070	10,927	15,752
1986	64,448	.26	333	1,379	349	2,535	11,986	16,582
1987	62,376	.33	441	3,420	378	2,779	13,692	20,710
1988	68,582	.24	393	4,205	375	4,237	6,901	16,111
1989	54,666	.31	361	6,436	1,130	3,719	5,108	16,754
1990	43,643	.27	284	5,274	355	2,384	3,426	11,723
1991	42,443	.33	498	6,094	374	2,088	5,060	14,114
1992	33,674	.30	400	5,255	213	1,071	3,185	10,124
1993	33,989	.41	595	7,748	338	1,374	3,789	13,844
1994	37,038	.40	295	8,019	214	1,382	4,898	14,808
1995	31,300	.47	294	5,496	256	2,490	6,117	14,653
1996	33,992	.40	173	2,892	222	2,306	8,134	13,727

TABLE 6
Two Rivers-Manitowoc Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	6,987	.26	58	78	285	1,337	107	1,865
1977	8,421	.36	15	266	765	1,746	258	3,050
1978	12,370	.24	23	297	325	1,629	765	3,039
1979	14,811	.35	39	263	216	3,993	615	5,126
1980	11,536	.40	86	212	923	2,427	937	4,585
1981	19,912	.36	41	106	245	5,081	1,789	7,262
1982	21,849	.34	25	114	407	4,629	2,242	7,414
1983	29,073	.43	61	158	145	9,222	2,780	12,498
1984	52,421	.29	221	406	2,063	8,189	4,565	15,448
1985	45,700	.30	556	307	1,145	5,957	5,738	13,712
1986	50,583	.28	351	345	738	4,814	7,784	14,032
1987	96,651	.32	1,060	5,903	1,609	9,331	12,547	30,450
1988	100,263	.25	700	6,356	1,435	11,087	5,418	24,996
1989	72,052	.27	527	4,525	1,105	9,193	4,277	19,627
1990	37,264	.25	469	1,321	304	5,138	1,906	9,138
1991	28,599	.32	238	1,811	229	5,553	1,396	9,227
1992	23,434	.26	563	1,402	124	2,949	1,086	6,124
1993	20,470	.34	248	2,001	169	3,326	1,211	6,955
1994	17,597	.30	332	2,227	224	1,508	1,070	5,361
1995	16,010	.37	241	1,724	187	2,615	1,207	5,974
1996	17,370	.34	139	1,370	855	1,064	2,551	5,979

TABLE 7
Sheboygan Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	6,142	.25	32	284	504	273	470	1,563
1977	9,374	.27	41	482	934	358	768	2,583
1978	7,748	.28	154	381	351	424	778	2,088
1979	13,137	.22	124	362	571	601	1,344	2,948
1980	16,381	.31	172	191	2,019	433	2,213	5,028
1981	22,137	.24	225	383	955	903	2,926	5,392
1982	35,860	.24	342	214	1,572	1,628	4,683	8,445
1983	54,136	.31	580	396	1,180	8,650	6,077	16,896
1984	68,200	.32	538	811	6,379	5,999	7,829	21,559
1985	65,851	.31	1,276	961	3,947	4,063	9,964	20,259
1986	68,677	.35	1,040	1,154	5,286	4,893	11,337	23,710
1987	63,243	.38	1,498	2,848	4,285	4,252	10,947	23,830
1988	75,690	.30	1,332	6,166	3,721	6,341	5,221	22,781
1989	60,532	.30	1,055	3,665	2,344	6,409	4,860	18,333
1990	48,129	.27	504	1,999	1,121	6,360	3,000	12,984
1991	41,143	.31	1,075	2,033	938	5,261	3,389	12,696
1992	36,833	.26	1,177	2,300	778	3,353	1,995	9,603
1993	32,125	.30	1,114	2,788	576	3,438	1,698	9,614
1994	30,095	.26	484	2,932	507	2,035	1,808	7,766
1995	27,314	.32	445	2,602	685	2,466	2,580	8,778
1996	27,368	.30	204	1,789	1,525	739	3,895	8,152

TABLE 8
Port Washington-Milwaukee Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	16,315	.16	50	310	1,165	341	828	2,694
1977	22,316	.23	108	251	2,419	386	1,874	5,038
1978	14,764	.19	74	141	723	190	1,699	2,827
1979	24,871	.22	206	214	1,255	750	2,935	5,360
1980	24,245	.28	221	139	3,086	325	3,120	6,891
1981	33,912	.26	275	307	2,639	976	4,604	8,801
1982	51,003	.24	300	155	4,152	1,500	6,303	12,413
1983	62,181	.22	388	236	1,650	3,379	7,798	13,451
1984	74,265	.24	470	298	5,121	1,223	10,624	17,841
1985	84,489	.25	956	238	6,882	834	12,569	21,495
1986	88,424	.27	849	309	7,736	1,428	13,662	23,984
1987	92,629	.29	919	1,816	8,126	1,870	14,060	26,791
1988	95,298	.29	1,900	1,814	13,701	1,360	8,998	27,773
1989	82,424	.29	1,183	2,560	11,046	2,747	6,100	23,636
1990	69,510	.23	691	1,901	5,181	3,026	4,954	15,753
1991	56,995	.28	832	2,095	4,358	2,802	5,818	15,905
1992	49,710	.27	1,125	2,423	4,604	1,853	3,237	13,242
1993	47,411	.38	1,049	6,701	4,961	1,776	3,422	17,909
1994	49,067	.34	810	5,640	4,999	1,669	3,415	16,533
1995	53,449	.40	657	8,058	4,478	2,608	5,566	21,367
1996	48,910	.37	517	3,269	7,475	779	6,120	18,160

TABLE 9
Racine-Kenosha Charter Fishery Effort,
Catch Rate, and Catch: 1976-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1976	5,930	.17	8	103	670	72	134	987
1977	9,462	.26	13	115	1,781	93	421	2,423
1978	12,051	.26	54	206	1,694	342	886	3,182
1979	10,118	.20	24	107	831	392	683	2,037
1980	14,108	.29	51	61	1,816	1,323	832	4,083
1981	14,907	.32	19	123	1,836	1,626	1,243	4,847
1982	38,663	.41	79	117	6,078	7,154	2,288	15,736
1983	61,167	.39	197	259	1,538	17,991	3,839	23,831
1984	61,867	.44	414	441	9,189	12,533	4,335	26,917
1985	46,249	.47	313	291	8,094	9,061	3,941	21,780
1986	59,207	.42	398	560	5,762	11,962	6,154	24,836
1987	53,427	.47	258	1,260	4,426	13,103	6,040	25,087
1988	53,090	.46	303	835	9,535	11,636	1,824	24,133
1989	50,349	.51	454	1,349	11,355	9,952	2,491	25,601
1990	44,707	.49	215	616	11,158	8,055	1,832	21,876
1991	43,460	.48	669	1,615	5,721	9,553	3,313	20,871
1992	45,243	.53	587	1,034	13,445	6,815	2,002	23,883
1993	43,022	.54	943	2,770	11,574	6,794	1,338	23,419
1994	48,397	.55	789	2,738	15,305	6,975	974	26,781
1995	45,837	.45	574	3,387	6,838	7,094	2,569	20,462
1996	52,816	.56	925	2,886	16,894	3,978	4,980	29,663

Figure 2. Harvest of salmonids by area (i.e. grid location) for Wisconsin's 1996 charter season.

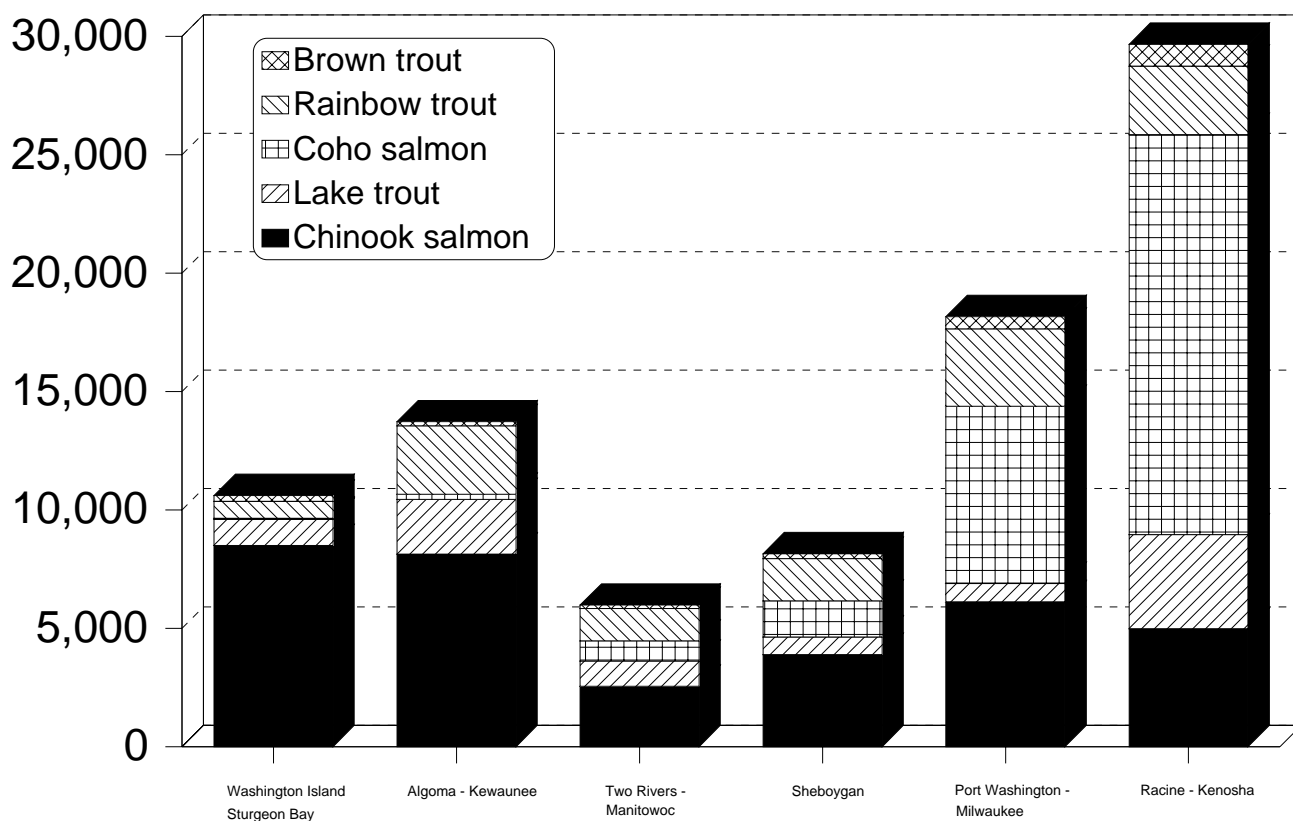


Table 10
Monthly Charter Fishery Effort, Catch and Catch Rate: 1985-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
Apr-85	1,980	0.52	278	4	532	86	117	1,031
-86	1,690	0.23	127	2	45	37	174	385
-87	3,133	0.17	269	2	143	0	119	533
-88	2,512	0.15	95	0	181	1	105	383
-89	2,509	0.25	263	4	282	44	30	623
-90	1,096	0.27	142	1	102	47	2	294
-91	608	0.30	143	0	19	20	3	185
-92	803	0.32	84	1	166	3	0	254
-93	306	0.18	45	2	7	0	0	54
-94	231	0.84	26	2	161	5	0	194
-95	480	0.20	43	2	33	15	3	96
-96	94	0.14	11	0	0	2	0	13
May-85	29,907	0.36	512	165	5,893	1,390	2,893	10,907
-86	36,854	0.42	264	426	5,446	2,601	6,715	15,452
-87	48,326	0.32	510	1,028	6,365	6,435	1,336	15,694
-88	36,212	0.43	246	861	11,174	2,895	459	15,647
-89	32,326	0.43	275	904	10,672	1,827	320	13,998
-90	21,646	0.38	183	259	5,852	1,628	316	8,238
-91	18,155	0.43	214	527	5,197	1,820	120	7,878
-92	16,747	0.50	50	218	7,396	600	40	8,304
-93	13,508	0.64	128	765	6,889	820	72	8,674
-94	14,032	0.83	59	1,888	8,964	539	221	11,671
-95	11,984	0.45	95	1,299	3,249	568	145	5,356
-96	9,564	0.59	94	345	4,991	185	52	5,667
Jun-85	85,148	0.30	1,151	740	8,081	8,000	7,344	25,417
-86	87,786	0.31	714	921	8,173	9,363	8,035	27,206
-87	98,871	0.33	823	3,579	8,172	9,750	10,026	32,350
-88	108,080	0.31	472	6,010	12,463	9,161	5,748	33,854
-89	95,019	0.32	456	8,483	9,654	10,777	1,451	30,821
-90	64,003	0.30	276	5,169	7,920	4,931	921	19,217
-91	59,237	0.34	349	6,340	3,734	7,987	1,749	20,159
-92	46,176	0.35	141	5,166	7,283	3,048	521	16,159
-93	42,611	0.43	335	6,014	7,247	4,021	666	18,283
-94	43,443	0.43	81	7,905	6,730	3,142	707	18,565
-95	44,681	0.40	96	7,421	3,774	5,362	1,012	17,665
-96	36,754	0.31	51	1,049	7,618	2,358	319	11,395
Jul-85	127,833	0.31	2,134	941	4,455	9,898	22,838	40,281
-86	142,957	0.29	1,855	1,268	4,637	8,429	25,801	41,987
-87	153,669	0.35	2,427	2,980	2,887	8,478	37,380	54,152
-88	177,029	0.25	2,457	3,541	3,054	16,878	18,315	44,245
-89	134,403	0.30	1,064	8,961	4,280	13,018	13,032	40,355
-90	104,814	0.27	1,498	5,182	2,794	9,802	8,955	28,231
-91	93,287	0.33	871	6,822	1,834	8,933	12,544	31,004
-92	75,379	0.30	1,223	3,907	3,468	6,927	7,440	22,965
-93	68,884	0.37	1,229	8,603	2,656	5,151	7,778	25,417
-94	72,065	0.39	1,370	10,012	4,648	4,382	7,593	28,005
-95	71,313	0.53	1,459	9,768	4,694	5,165	16,417	37,503
-96	68,146	0.39	396	3,798	9,868	2,996	9,660	26,718
Aug-85	93,707	0.31	1,455	644	1,692	5,978	18,918	28,740
-86	117,258	0.28	1,169	1,222	1,511	7,322	21,946	33,170
-87	115,960	0.30	1,237	5,678	1,009	7,230	19,813	34,967
-88	118,556	0.26	1,807	7,772	1,350	7,949	12,455	31,333
-89	104,657	0.30	2,855	1,577	2,511	7,673	16,995	31,611
-90	89,526	0.28	1,839	1,620	1,154	9,634	10,475	24,722
-91	76,203	0.32	1,898	1,362	663	7,036	13,422	24,381
-92	66,544	0.27	1,750	2,970	744	5,872	6,340	17,676
-93	67,215	0.35	2,243	7,548	749	6,450	6,837	23,827
-94	63,533	0.29	1,357	3,451	683	5,583	7,413	18,487
-95	55,097	0.35	827	3,011	636	6,169	8,911	19,554
-96	69,022	0.45	1,151	4,780	3,538	3,445	18,483	31,397
Sep-85	28,041	0.24	263	282	396	1,095	4,597	6,646
-86	26,575	0.21	168	153	619	100	4,414	5,454
-87	39,226	0.28	421	2,072	493	801	7,263	11,050
-88	37,900	0.18	659	1,688	690	571	3,379	6,987
-89	32,118	0.21	792	996	539	665	3,756	6,748
-90	25,849	0.18	439	535	349	783	2,522	4,628

-91	21,455	0.22	1,199	266	235	89	2,828	4,617
-92	17,673	0.29	1,326	1,459	124	267	1,933	5,109
-93	19,327	0.26	977	1,861	127	807	1,213	4,985
-94	18,235	0.25	418	1,297	77	560	2,203	4,555
-95	17,582	0.24	191	1,535	96	969	1,420	4,211
-96	21,863	0.46	407	2,887	966	879	4,871	10,010
Oct-85	566	0.48	8	14	9	28	212	271
-86	1,700	0.22	5	11	7	5	352	380
-87	2,166	0.42	18	296	9	2	585	910
-88	4,396	0.24	80	618	24	3	344	1,069
-89	3,400	0.21	45	375	11	12	277	720
-90	1,821	0.20	46	171	14	4	131	366
-91	1,469	0.16	85	61	4	8	84	242
-92	1,932	0.31	159	240	10	1	182	592
-93	1,347	0.17	78	98	1	0	52	229
-94	1,574	0.26	67	86	5	1	255	414
-95	1,882	0.27	19	29	10	84	365	507
-96	2,452	0.44	94	58	44	107	788	1,091

TABLE 11
Algoma Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	29,633	0.36	429	4,446	159	1,345	4,166	10,545
1992	22,877	0.29	294	3,540	128	613	2,156	6,731
1993	25,043	0.43	457	6,067	188	1,036	3,129	10,877
1994	28,508	0.44	212	6,882	319	1,031	4,086	12,530
1995	23,286	0.51	243	4,292	332	1,915	5,052	11,834
1996	25,954	0.41	136	1,860	182	1,869	6,702	10,749

TABLE 12
Baileys Harbor Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	7,377	0.29	217	624	19	78	1,213	2,151
1992	5,316	0.24	154	652	1	86	389	1,282
1993	7,181	0.41	264	1,128	127	121	1,308	2,948
1994	7,510	0.28	85	1,446	79	61	403	2,074
1995	4,198	0.38	46	425	9	353	778	1,611
1996	4,873	0.30	52	246	3	199	941	1,441

TABLE 13
Ellison Bay Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	1,581	0.21	35	9	0	0	294	338
1992	1,005	0.19	40	2	0	0	148	190
1993	665	0.13	9	0	0	2	76	87
1994	860	0.24	23	4	0	0	180	207
1995	1,083	0.55	20	6	9	2	556	593
1996	1,362	0.42	13	1	0	21	532	567

TABLE 14
Ephraim/Fish Creek Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	900	0.16	14	39	0	4	88	145
1992	95	0.12	5	0	0	0	6	11
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	1,076	0.44	30	4	0	0	435	469
1996	805	0.11	7	1	0	0	80	88

TABLE 15
Gills Rock Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	25,337	0.20	599	91	9	17	4,311	5,027
1992	17,992	0.14	488	91	6	10	1,858	2,453
1993	16,807	0.12	485	117	5	34	1,412	2,053
1994	13,225	0.27	381	309	4	74	2,789	3,557
1995	11,885	0.44	272	428	10	89	4,397	5,196
1996	9,613	0.26	130	61	60	103	2,137	2,491

TABLE 16
Green Bay Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	1,475	0.24	6	122	12	10	201	351
1992	1,097	0.27	4	90	6	10	190	300
1993	90	0.22	0	0	0	0	20	20
1994	-	-	-	-	-	-	-	-
1995	244	0.49	0	0	0	0	119	119
1996	4	0.00	0	0	0	0	0	0

TABLE 17
Kenosha Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	19,388	0.54	389	861	3,936	3,513	1,704	10,403
1992	21,585	0.62	256	548	8,914	2,741	884	13,343
1993	20,615	0.62	443	1,485	7,774	2,338	674	12,714
1994	19,292	0.62	285	1,035	8,244	1,979	327	11,870
1995	18,362	0.45	263	1,524	3,445	2,183	794	8,209
1996	17,586	0.62	190	1,327	7,115	979	1,318	10,929

TABLE 18
Kewaunee Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	13,391	0.30	136	1,378	199	717	1,540	3,970
1992	8,352	0.26	84	1,043	77	326	640	2,170
1993	8,941	0.33	146	1,597	152	371	722	2,988
1994	9,286	0.33	95	1,590	89	401	855	3,030
1995	8,617	0.36	51	1,246	99	661	1,067	3,124
1996	9,029	0.39	40	1,127	58	481	1,853	3,559

TABLE 19
Manitowoc Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	9,322	0.34	98	729	97	1,591	619	3,134
1992	6,205	0.26	245	443	61	514	372	1,635
1993	6,873	0.40	115	966	84	1,118	448	2,731
1994	6,148	0.35	148	994	76	495	413	2,126
1995	6,953	0.43	147	1,044	128	1,048	624	2,991
1996	6,326	0.40	70	712	408	351	1,012	2,553

TABLE 20
Marinette-Menominee Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	1,392	0.12	138	5	2	0	16	161
1992	654	0.08	39	2	0	0	10	51
1993	304	0.37	100	0	2	0	9	111
1994	-	-	-	-	-	-	-	-
1995	275	0.21	39	1	0	0	19	59
1996	98	0.08	5	0	0	0	3	8

TABLE 21
Milwaukee Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	15,155	0.26	310	397	773	473	2,063	4,016
1992	12,665	0.27	671	266	1,206	234	1,081	3,458
1993	14,991	0.35	901	819	1,313	668	1,500	5,201
1994	15,480	0.31	556	832	1,933	564	981	4,866
1995	16,690	0.32	430	1,005	965	521	2,348	5,269
1996	12,374	0.33	258	328	1,245	220	2,042	4,093

TABLE 22
Port Washington Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	43,206	0.29	640	1,795	3,628	2,379	4,117	12,559
1992	37,023	0.26	459	2,164	3,357	1,577	2,147	9,704
1993	33,818	0.39	240	6,030	3,508	1,298	2,068	13,144
1994	36,367	0.35	301	5,287	3,324	1,278	2,602	12,792
1995	37,390	0.44	228	7,208	3,556	2,086	3,332	16,410
1996	38,856	0.40	305	3,088	7,167	618	4,368	15,546

TABLE 23
Racine Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	16,646	0.43	137	400	1,525	4,477	636	7,175
1992	14,964	0.43	122	281	2,457	3,156	353	6,369
1993	16,261	0.44	268	609	2,806	3,317	219	7,219
1994	16,474	0.48	325	418	3,896	3,029	200	7,868
1995	13,751	0.43	122	553	1,624	3,136	450	5,885
1996	14,665	0.48	233	394	4,100	1,560	788	7,075

TABLE 24
Rowley's Bay Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	-	-	-	-	-	-	-	-
1992	1,192	0.25	2	63	0	11	218	294
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	601	0.77	9	71	3	26	355	464
1996	1,202	0.46	0	3	1	52	493	549

TABLE 25
Sheboygan Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	42,196	0.31	1,076	2,086	924	5,413	3,497	12,996
1992	37,767	0.26	1,245	2,412	786	3,390	2,078	9,911
1993	31,478	0.30	1,103	2,773	562	3,288	1,673	9,399
1994	29,438	0.25	485	2,761	464	1,947	1,829	7,486
1995	27,318	0.32	447	2,573	625	2,410	2,581	8,636
1996	27,290	0.30	213	1,783	1,435	732	3,926	8,089

TABLE 26
Sister Bay Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	974	0.13	26	101	0	0	0	127
1992	746	0.12	37	2	0	0	52	91
1993	691	0.05	22	0	0	0	15	37
1994	715	0.11	53	0	0	0	29	82
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-

TABLE 27
Sturgeon Bay Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	12,977	0.41	226	864	49	486	3,656	5,281
1992	11,074	0.44	73	1,638	34	704	2,394	4,843
1993	9,002	0.48	131	1,647	40	385	2,076	4,279
1994	7,971	0.57	90	1,292	12	494	2,617	4,505
1995	9,210	0.52	95	1,051	30	643	2,993	4,812
1996	8,619	0.56	32	366	26	764	3,602	4,790

TABLE 28
Two Rivers Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	17,989	0.32	124	991	104	3,939	649	5,807
1992	14,453	0.25	300	484	42	2,377	471	3,674
1993	12,422	0.31	113	887	60	2,094	674	3,828
1994	9,556	0.28	157	1,000	74	919	495	2,645
1995	8,065	0.34	92	601	58	1,470	532	2,753
1996	9,316	0.31	52	543	381	598	1,345	2,919

TABLE 29
Washington Island Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	4,448	0.21	15	14	0	1	886	916
1992	1,079	0.24	4	30	3	5	218	260
1993	1,256	0.13	2	30	0	5	131	168
1994	567	0.33	7	29	0	3	147	186
1995	1,042	0.52	5	15	2	2	514	538
1996	900	0.36	11	0	0	8	305	324

TABLE 30
Winthrop Harbor Charter Fishery Effort,
Catch Rate, and Catch: 1991-1996

Year	Angler Hours	Fish per Angler Hour	Brown Trout	Rainbow Trout	Coho Salmon	Lake Trout	Chinook Salmon	Total
1991	2,452	0.40	43	142	48	474	300	1,007
1992	7,420	0.33	182	167	1,683	871	660	3,563
1993	6,740	0.54	236	736	1,055	1,174	464	3,665
1994	11,716	0.52	175	762	2,754	1,937	439	6,067
1995	12,973	0.46	191	1,018	1,597	1,787	1,327	5,920
1996	19,023	0.55	457	1,077	4,844	1,417	2,726	10,521

TABLE 31
Sea Lamprey incidence (lampreys per 100 fish) for chinook salmon and lake
trout harvested by Wisconsin's charter boat fishery in Lake Michigan, 1992-1996.

Year	Chinook salmon	Lake trout
1992	0.09	0.35
1993	0.05	0.26
1994	0.05	0.18
1995	0.10	0.20
1996	0.04	0.17

Figure 3. Harvest of salmonids by homeport for Wisconsin's 1996 charter season.

